

Weekly Discovery

We SHARE to inspire and ignite ideas!

4 Sep – 8 Sep 2023

ARCHITECTURE

Brick by Brick, Waste Can Shape the Future of Construction



"Artificial intelligence (AI) is being increasingly integrated into scientific discovery to augment and accelerate research, helping scientists to generate hypotheses, design experiments, collect and interpret large datasets, and gain insights that might not have been possible using traditional scientific methods alone. Here we examine breakthroughs over the past decade that include self-supervised learning, which allows models to be trained on vast amounts of unlabelled data, and geometric deep learning, which leverages knowledge about the structure of scientific data to enhance model accuracy and efficiency. Generative AI methods can create designs, such as small-molecule drugs and proteins, by analysing diverse data modalities, including images and sequences. We discuss how these methods can help scientists throughout the scientific process and the central issues that remain despite such advances. Both developers and users of AI tools need a better understanding of when such approaches need improvement, and challenges posed by poor data quality and stewardship remain. These issues cut across scientific disciplines and require developing foundational algorithmic approaches that can contribute to scientific understanding or acquire it autonomously, making them critical areas of focus for AI innovation."

Source: [Archdaily](#) (29 Aug 2023)

ARCHITECTURE

Colour in Architecture as a Powerful Communication Tool



"Contrary to popular belief, Roman buildings were not as monochrome as previously thought. Recent discoveries indicate that statues and structures were, in fact, richly adorned with bright colors and exuberant decorations, following the tradition established by their Greek predecessors. This may be surprising, but it shows the presence of color in architecture much earlier than imagined. Color has always played a significant role in shaping the perception and experience of a space and was prominent in the works of seminal architects such as Le Corbusier and Luis Barragán, for example. Another master of the use of color was Michael Wilford, who, together with his former partner James Stirling gained international recognition with notable public buildings, art centers, museums, and libraries located worldwide. The volumes present in Wilford's architecture are often remembered for their careful use of color, which highlights certain elements and adds other dimensions to the structures."

Source: [Archdaily](#) (30 Aug 2023)

ARCHITECTURE

Un-Building: A Utopia of Receding Construction

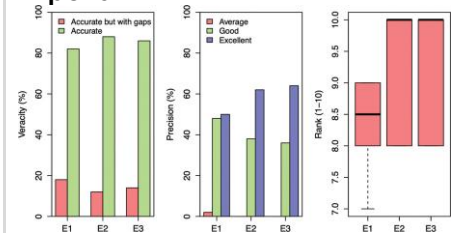


"Spanning the past two centuries, the world has seen voracious urban expansion premised on exponential population growth and radical transformations in the productive means and methods used to generate goods. This has resulted in built environments designed for social performance and economic production becoming indifferent (if not antagonistic) to the sustenance of pre-existing ecological relationships. In a world that is progressively broken by long-term and sustained environmental abuse, architects need to reconsider how architecture is produced in relation to regional biotic networks. Architectural production may need to be re-approached through non-additive strategies. It is time for architecture to assimilate subtractive strategies, that is un-building part of what has been built to rebalance the relationship between the ecological conditions and the constructed environment. This paper suggests two operating reformulations that could be considered utopian or lead to actual strategies of renaturalisation: succession, where structures would be reoccupied by natural ecosystems, and withdrawal, where structures would be progressively disassembled and removed to reinstate a natural landscape. The discussion on the two strategies will focus on the elimination of what is constructed, the assimilation of subtractive strategies, and the un-building of parts of what have been built to rebalance the relationship between the ecological conditions and the constructed environments."

Source: [Taylor&Francis](#) (1 Sep 2023)

ARTIFICIAL INTELLIGENCE

ChatGPT Is Debunking Myths on Social Media Around Vaccine Safety, Say Experts



"ChatGPT could help to increase vaccine uptake by debunking myths around job safety, say the authors of a study published in the peer-reviewed journal Human Vaccines and Immunotherapeutics.

The researchers asked the artificial intelligence (AI) chatbot the top 50 most frequently-asked Covid-19 vaccine questions. They included queries based on myths and fake stories such as the vaccine causing Long Covid.

Results show that ChatGPT scored nine out of 10 on average for accuracy. The rest of the time it was correct but left some gaps in the information provided, according to the study."

Source: [EurekAlert!](#) (3 Sep 2023)

ARTIFICIAL INTELLIGENCE

How Soon AI Will Start Firing Programmers?

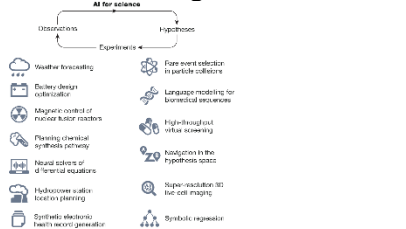


"The release of ChatGPT 3.5 has been a game-changer for us programmers. While most of us, myself included, don't fully grasp how it functions, some have come to rely on it even more than Stack Overflow, Google, or IDE built-in features. I think we're just scratching the surface. Although only Microsoft can truly predict what comes next, I'd like to offer my own modest forecast. Below, I outline what I think robots equipped with Generative AI will accomplish in the future. Items later on the list represent further-off predictions. I've tried not to rehash what's already been said by GitHubNext."

Source: [ACM](#) (3 Sep 2023)

ARTIFICIAL INTELLIGENCE

Scientific Discovery in The Age of Artificial Intelligence



"Artificial intelligence (AI) is being increasingly integrated into scientific discovery to augment and accelerate research, helping scientists to generate hypotheses, design experiments, collect and interpret large datasets, and gain insights that might not have been possible using traditional scientific methods alone. Here we examine breakthroughs over the past decade that include self-supervised learning, which allows models to be trained on vast amounts of unlabelled data, and geometric deep learning, which leverages knowledge about the structure of scientific data to enhance model accuracy and efficiency. Generative AI methods can create designs, such as small-molecule drugs and proteins, by analysing diverse data modalities, including images and sequences. We discuss how these methods can help scientists throughout the scientific process and the central issues that remain despite such advances. Both developers and users of AI tools need a better understanding of when such approaches need improvement, and challenges posed by poor data quality and stewardship remain. These issues cut across scientific disciplines and require developing foundational algorithmic approaches that can contribute to scientific understanding or acquire it autonomously, making them critical areas of focus for AI innovation."

Source: [Nature](#) (30 Aug 2023)

DESIGN

London South Bank University Showcases 10 Design Student Projects



"School statement: "Are you creative, curious and inquisitive?"

"At LSBU we believe that designers have an important role to play in creating a better future that focuses on people and the planet."

"Blending systems, thinking and human-centred design with technical analysis as well as physical and digital prototyping, you'll learn the intellectual and practical skills you need to become a well-rounded designer or design engineer."

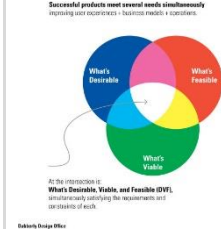
"You can select from BSc (Hons) Product Design, BSc (Hons) Engineering Product Design and BSc (Hons) Product Design Development Engineer Apprenticeship courses."

"The courses culminate in a final year degree show of outstanding prototypes called Product of South Bank."

Source: [Dezeen](#) (3 Sep 2023)

DESIGN

Rethinking Design Education



"This opening article for the special issue on the Future of Design Education traces paradigmatic shifts in design, from the twentieth-century mass production of artifacts to the twenty-first-century stewardship of evolving product-service ecologies. These shifts argue for a systems approach appropriate to the complex problems brought on by the industrial and information revolutions. Setting the stage for the following topical articles, the authors describe connections among human activities and technologies that are life-centred in their long-term impact on and by humankind. These changes are not simply in the things designers make but in the "why" of design practice under a paradigm that no longer focuses on the production of tangible goods. The article also addresses corresponding shifts in where designers now take action (for example, influencing organizational purpose, governance, infrastructure, and strategy, not just consumer-facing messages, objects, and spaces) and the lengthening of time horizons for evaluating design effects in natural, social, and technical systems. Ten principles for today's designers offer guideposts for practice and inform a critique of the industrial-era traditions still present in much of contemporary design education."

Source: [ScienceDirect](#) (1 Sep 2023)

MATERIALS

How Would Room-Temperature Superconductors Change Science?



"The wave of excitement caused by LK-99 — the purple crystal that was going to change the world — has now died down after studies showed it wasn't a superconductor. But a question remains: would a true room-temperature superconductor be revolutionary?"

The answer is that it depends — on the application, and on whether the hypothetical material also has other crucial qualities. But at least in some scientific fields, in particular those that use strong magnetic fields, better superconductors would be likely to have a huge impact."

Source: [Nature](#) (1 Sep 2023)

NATURAL SCIENCE

"Ghostly" Neutrinos Help Us See Our Milky Way as Never Before



"In 1923, French writer Marcel Proust published the fifth book of his seven-volume epic Remembrance of Things Past. In it, he wrote a passage that has over time been paraphrased as "the real voyage of discovery consists... not in seeking new landscapes, but in having new eyes." This is a message that astronomers have long known, and it was demonstrated yet again in a recent announcement of a new and unique photograph of the Milky Way galaxy. This image opens up an entirely different way of understanding our galactic environment.

Since time immemorial, astronomers have observed the sky using the electromagnetic spectrum, from the unaided eye of prehistory to the first use of a telescope in 1610. That was followed by radio waves in 1932 and gamma rays in the 1960s. But electromagnetic radiation (the particle form of which is a photon) isn't the only thing that can cross interstellar space. Another messenger is the enigmatic neutrino, a particle emitted in some types of nuclear decay."

Source: [JSTOR](#) (31 Aug 2023)

OBESITY

Researchers Identify the Link Between Memory and Appetite in The Human Brain to Explain Obesity

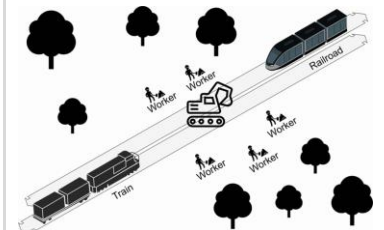


"Disrupted connections between memory and appetite regulating brain circuits are directly proportional to body mass index (BMI), notably in patients who suffer from disordered or overeating that can lead to obesity, such as binge eating disorder (BED), according to new research. The research notes that individuals who are obese have impaired connections between the dorsolateral hippocampus (dlHPC) and the lateral hypothalamus (LH), which may impact their ability to control or regulate emotional responses when anticipating rewarding meals or treats."

Source: [Sciencedaily](#) (30 Aug 2023)

WIRELESS COMMUNICATION

Infrastructure-Less Long-Range Train-Arrival Notification System



"This paper presents a portable, inexpensive, wireless and long range train arrival notification system for railway safety applications. The purpose of the system is to notify workers servicing the rails about the arrival of a train in both directions of a railway in order to avoid accidents. The system consists of several components: the train coordinates system, the portable station component, the worker's wearable, and an Android application. A description of each of the components of the system is given focus on the communication mechanisms between those components. The system has been deployed in an experimental environment in Kazakhstan and the first experiments showed a communication range of several kilometers as well as low repeated number of packet losses. Moreover, the proposed protocol for the wearables exhibited an over 99.5% packet reception ratio (PRR) for scenarios without the presence of major obstacles."

Source: [IEEE](#) (28 Aug 2023)